IC6.3: Optional Job Sheet

Using Ensembles in Winter Weather Forecasting

Objectives:
Examine SREF data to aid in the forecasting of a winter weather event
Use online ensemble web pages to learn how to access data (like that used in the lesson) for future analysis

Data: NCEP SREF data from 20 December 2004, the 21 UTC run. A new tool, the picflip viewer will be used to browse the data. The internet will also be used to create graphics like those used in the lesson.

Instructions: For the first part of this exercise you will be using the picflip viewer to answer questions in this jobsheet.
Your Winter Weather AWOC facilitator will be able to tell you where the picflip viewer is located, as it could be on a training PC or on the WES box, or both. Check with your facilitator on how to start the viewer. After it loads, a menu will pop up that looks like Figure 1, and you will be ready to begin. Because you will be using the picflip viewer during the winter weather AWOC WES simulation, this is a good opportunity to become familiar with its controls.

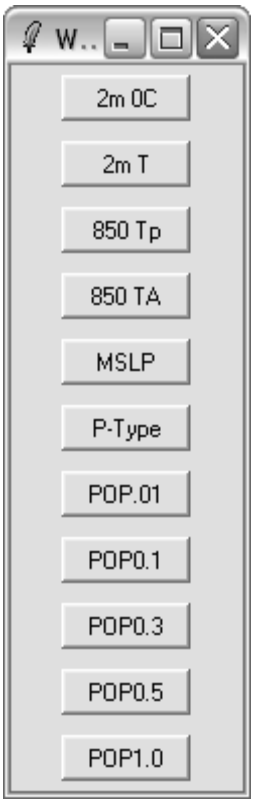

Fig. 1: The picflip start menu

Using the picflip viewer, load the spaghetti plot of 2 m 0^{o}C by clicking the button located at the top of the picflip menu shown in Figure 1. The viewer loads a spaghetti plot of the location of the 2 meter AGL freezing line (top) and a probability chart (bottom).

Notice the navigation buttons at the top of the picflip viewer (shown below). Use the < > buttons to step forward or backward, << >> to skip 5 frames forward or backward, and |< >| to skip to the beginning and end of the forecast loop.

Fig 2: The picflip controls console

Examine the "2m 0^{o}C" surface freezing line forecast valid at 12 UTC on 22 December across the Ohio and Lower Mississippi Valleys, and answer the following two questions:

Question 1. Where is the variability in 2 m temperatures maximized at 12 UTC on the 22nd (illustrated by the grey shading in the upper plot)?

Question 2. In southern Indiana at 12 UTC on the 22nd, is it likely that it will be significantly warmer or colder than freezing? (i.e. examine location of the 2m temperature variability relative to the spaghetti plot)

Load the NCEP SREF precipitation-type probabilities by clicking on the "P-Type" button. Scroll ahead to 12 UTC on Dec 22. This loads the mean probability of rain (top left), snow (top right), sleet (bottom left), and freezing rain (bottom right), with mean 3 hr QPF overlaid with black contours.

Question 3. Where is the snow most likely to fall?

Question 4. What is the highest probability of sleet and freezing rain, and where are those two most likely to fall?

Question 5. Based only on these graphics, briefly describe the types of precipitation you expect across the state of Indiana from 12 UTC on the 22nd through 00 UTC on the 23rd.

Load the probability of exceeding of 0.5 inch in 24 hours (click on POP0.5). Step to the forecast valid from 00 UTC on 22 December to 00 UTC on 23 December.

Question 6. Where is the highest probability for 0.5 inches of liquid equivalent in 24 hours?

Question 7. Based on this graphic and the P-Type graphic where is the most likely location for significant accumulations of winter precip?

Feel free to load any of the other SREF products in order to become familiar with SREF data and the picflip viewer.

Real-time SREF/MREF Data

Go to the subsequent websites to learn where to access CONUS or OCONUS ensemble information for the SREF and MREF data. Although winter weather may not be in the forecast when the website is accessed, learning how and where to apply the information from this lesson can still a valid exercise. Bookmark any sites you find useful.

For CONUS weather, access the following website (this may take up to a minute to load):

http://eyewall.met.psu.edu/ensembles/index.html

Select “SREF” as the model and “US/MSLP” as the product, and navigate through the loop using the player keys. Look for areas of low pressure in the mean of the ensembles in the bottom plot (green isobars). Look for areas of high variability in the ensemble members in the top plot (grey shading). Where variability in the ensemble members overlaps with the low in the mean values is where uncertainty in strength of the low exists. If the high variability in the ensemble members is displaced from the low, position differences are likely between the ensemble members.

Select “SREF” as the model and “US/POP240.20” as the product, and navigate through the loop using the player keys. Look for areas of high probability of precipitation > 0.2 in 24 hours.

Select “SREF” as the model and “PTYPE” as the product, and navigate through the loop using the player keys. Evaluate the phase of precipitation along with the amounts. Explore other parameters in the list if interested.

For OCONUS weather (Alaska or Hawaii), access the following website:
http://wwwt.emc.ncep.noaa.gov/mmb/SREF/SREF.html
and click on “Alaska” or “Hawaii” links under the General Weather Forecasting.

Select “Mean&Spread” under “Change Type” and “Pressure” under “Change Field” to load the mslp mean (isobars) and spread (shading). Look for the relative position of the low and the spread of mslp. Where spread in the ensemble members overlaps with the low is where uncertainty in strength of the low exists. If the high spread in the ensemble members is displaced from the low, position differences are likely between the ensemble members.

Select “Probability” under “Change Type” and “24hr prcp(in)” under “Change Field” and “>0.25(inch)” under “Select a Threshold” to load the probability of precip > 0.25 inches. Look for areas of high probabilities of 24 hour precip.
Select “Probability” under “Change Type” and “24Hr Snow(in)” under “Change Field” and “2(inch)” under “Select a Threshold” to load the probability of 2 inch accumulations of snow. Look for areas of high probabilities of 24 hour snow.

Explore other parameters in the list if interested.

A list of ensemble prediction data sites to explore:

1. NCEP’s Official SREF site is: http://wwwt.emc.ncep.noaa.gov/mmb/SREF/SREF.html
2. NCEP’s Official MREF site is: http://www.emc.ncep.noaa.gov/gmb/ens/
3. Storm Prediction Centers ensemble pages(with severe parameters) : http://www.spc.noaa.gov/exper/sref/
4. PSU-NWS jump page for ensemble links: http://nws.met.psu.edu/models/index.htm

An answer key is available for this job sheet. Please see your local AWOC Winter Weather facilitator to obtain a copy.